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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/814,019

03/31/2004

Andrei Leonida

67010-072; H2715-SS

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EXAMINER

CREPEAU, JONATHAN

ART UNIT

PAPER NUMBER

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/814,019	<b>Applicant(s)</b> LEONIDA ET AL.	
	<b>Examiner</b> Jonathan Crepeau	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11-20 and 22-29 is/are pending in the application.
- 4a) Of the above claim(s) 11-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 22-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 1-9, 11-20, and 22-29. Claims 11-20 remain withdrawn from consideration. Claims 1-9 and 22-29 remain rejected under 35 USC 103 for substantially the reasons of record. Accordingly, this action is made final.

### ***Claim Rejections - 35 USC § 103***

2. Claims 1-3, 5-9 and 22-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Titterington et al (U.S. Patent 5,316,644) in view of WO 2004/086541 in view of Fujii et al (U.S. Patent 4,798,946).

Titterington et al. teach an electrochemical cell structure comprising a first conductive member (e.g., 10) and a second conductive member (e.g., 10") stacked along an axis (see abstract; Figs. 1 and 3). The conductive members each comprise a central area (11) and a peripheral area (12), the central area comprising a plurality of openings in fluid communication with the openings on an adjacent member. Regarding claims 5 and 6, the first and second peripheral areas comprise holes (13-20).

Titterington et al. do not expressly teach that the first conductive member has a volume on the first peripheral area and the second conductive member has a protrusion on the second peripheral area extending into the volume, and a securing member located therebetween, as recited in claim 1.

WO '541 is directed to an integrated electrically conductive electrochemical cell component. As shown in Figure 3b and described in [0044], two plates are sealed together in their peripheral region by welding and comprise a protrusion and volume structure (25, 30) having a polymeric securing member (35) therebetween. In [0045], it is also disclosed that the welding method may also be used to create a seal at the periphery of the manifold holes of the plates. However, the method for joining the plates together is not limited to welding (see [0039]).

It is submitted that the artisan would be motivated to use the sealing configuration of WO '541 in the electrochemical cell of Titterington et al. In [0010], WO '541 teaches that "[t]here, therefore, remains a need to provide improved seals for bi-polar or coolant plates, and a process for making such seals, which reduces the disadvantages associated with conventional sealing techniques." Accordingly, the artisan would be motivated to use the sealing configuration of WO '541 in the electrochemical cell of Titterington et al.

However, neither Titterington et al. nor WO '541 expressly teaches that the volume is sized larger than the protrusion prior to insertion of the protrusion into the volume as recited in claim 1.

Fujii et al. is directed to a plastic package for an IC card. In Figures 8, 9, 10, and 12, the reference teaches sealing configurations wherein a protrusion (24) is sized to be smaller than a volume (14) before insertion of the protrusion into the volume. A bonding agent (adhesive) is present in the volume prior to the joining of the surfaces.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the sealing configuration of Fujii et al. in the electrochemical cell of Titterington et al. as modified by WO '541. In column 2, line 48, Fujii et al. teach the following:

Preferably, the dimensions of the depressions of the engaging portions are larger than those of the projections so that when the two package sections are combined with one another, a gap will be left between at least one portion of the projection and the corresponding depression and the bonding agent will not be forced out of the projection.

Furthermore, the claims would have been obvious because the sealing technique for improving a particular class of devices (electrochemical cells) was part of the ordinary capabilities of a person of ordinary skill in the art, in view of the teaching of the technique for improvement in other situations (IC card packages, as disclosed above).

Regarding claim 3, this claim is a product claim that recites the process by which the adhesion is carried out and is therefore given little patentable weight (MPEP 2113).

Regarding claims 5 and 6, which recite that the volume and protrusion extend at least partially around holes in the peripheral area, it would be obvious to seal the holes (13-20) of Titterington with the volume and protrusion structure disclosed by WO '541 (the latter expressly disclosing manifold sealing in [0045]).

Regarding claims 7 and 9, Figure 3d of WO '541 discloses a first protrusion spaced radially from a second protrusion. Accordingly, it would also be obvious to incorporate this structure into the electrochemical cell of Titterington et al.

Regarding claim 8, it would be obvious to seal the entire circumferential periphery of Titterington et al. with the sealing structure of WO '541 in order to effectively seal the entire circumference of the plates.

Regarding claims 22 and 23, which recite another volume (protrusion) spaced from and extending transversely from the first volume (protrusion), the combination of circumferential sealing and manifold hole sealing in Titterington et al. would read on this subject matter since portions of the manifold seals would be at approximately right angles to the circumferential seal(s).

Regarding claim 24, the volume of Fujii et al. is sized to accommodate the bonding agent in its liquid state.

Regarding claims 25 and 26, the volume of Fujii et al. forms first and second receiving volumes when the protrusion is disposed in the volume.

Regarding claim 27, which recites another protrusion spaced from the protrusion and forming a tortuous path, it would be obvious to use discontinuous or irregularly spaced protrusions to seal the circumference and/or manifolds of Titterington et al., thereby forming the claimed tortuous path. Since the plates of WO '541 are eventually joined using a welding process, the use of fewer protrusions would decrease the welding contact area and therefore result in a savings of energy during welding. Additionally, if the protrusions are appropriately located and overlapped, there would be no decrease in sealing capability of the plates. As such, the subject matter of claim 27 would be rendered obvious.

Note: WO '541 has an effective date of March 25, 2003 since it qualifies as prior art under 35 USC 102(e) and the subject matter relied upon is disclosed in 60/457,459.

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Titterington et al. in view of WO '541 in view of Fujii et al. as applied to claims 1-3, 5-9 and 22-29 above, and further in view of Mao et al (U.S. Patent 6,989,214).

None of the applied references teaches that the adhesive tape comprises an ethylene acrylic acid copolymer, as recited in claim 4.

Mao et al. teach an ethylene acrylic acid copolymer adhesive tape for use in an electrochemical cell in column 12, line 29.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Here, the use of the ethylene acrylic acid copolymer adhesive as disclosed in Mao et al. would render obvious its use as an adhesive in the cell of Titterington et al./WO '541/Fujii et al.

#### ***Response to Arguments***

4. Applicant's arguments filed August 11, 2008 have been fully considered but they are not persuasive. Applicants assert that Fujii et al. teaches away from its combination with the

vibrational welding technique of WO '541. However, WO '541 is not limited to a vibrational welding technique, and also discloses ultrasonic welding, laser welding, heat lamination, or "hot bonding techniques" (see [0039]). Thus, in light of these other techniques, in particular the latter two, Applicant's argument is not persuasive. Further, even if the disclosure of WO '541 was limited to vibrational welding, the Examiner does not concede that applicant's assertion that "vibration welding as taught by WO '541 would likely cause such liquid bonding agent, to, in fact, be forced out of groove 14 [of Fujii et al]" would be persuasive.

Regarding claims 7 and 9, Applicants urge that since the plates of WO '541 are rectangular, it cannot teach radially spacing the protrusions/volumes. However, even in a planar rectangular fuel cell, it is submitted that the "radial" direction can be envisioned as the direction perpendicular to the center longitudinal axis of the stack. Therefore, Fig. 3d of WO '541 does in fact show "radially spaced" volumes and protrusions. Furthermore, when employed in the cylindrical cell of Titterington et al, such volumes/protrusions would clearly be spaced in a radial direction as best shown in the plan view of Fig. 1 of Titterington et al.

Applicants further state that none of the references show a "tortuous path," and request that the Examiner provide a basis for contending that one of ordinary skill in the art would find it obvious to create such a path. In response, it is noted that although it appears to be the intent of the claim language to recite a tortuous path in the x-y direction of the plates (i.e., in the planes of the plates), it is submitted that this language also reads on tortuosity in the z direction. In this regard, the art of record is already believed to disclose a "tortuous path" (in particular Fig. 3d of WO '541 as modified by Fujii et al.). See also [0043] of U.S. Pre-Grant Publication No.



2003/0179167, which discloses that "the surface of the retainer in contact with the sealing member...may have one or more enclosed raised ridges to seal against a sealing surface and form a seal that provide a tortuous path so that the possibility of fluid leaks is significantly reduced," and paragraph [0006] of U.S. Pre-Grant Publication No. 2004/0091702, which discloses that "some users attempt to address seal quality shortcomings by double- or triple-wrapping the desired item to form a tortuous labyrinth seal path of increased length." These disclosures generally describe the benefits of "tortuous" sealing paths and also indicate to one of skill in the art that such a "tortuous" sealing path can be formed by a plurality of raised obstructions or ridges, which is similar to Fig. 3d of the WO '541 reference relied upon above. In fact, Fig. 3d discloses the claimed first, second, and third protrusions that form a tortuous path. Further, it also submitted that, pursuant to the teachings of the '167 publication above, a longer seal path provides a tortuous path, and as such it would also be obvious to "lengthen" the sealing path in the seal of Titterington et al./WO '541/Fujii et al. by staggering the locations of the volumes/protrusions within the planes of the plates, thus increasing the total circumferential length of the seal. Thus, it is submitted that claim 27 is still rendered obvious by the references.

***Conclusion***

5. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

Art Unit: 1795

applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jonathan Crepeau/  
Primary Examiner, Art Unit 1795  
November 15, 2008